

MANUFACTURE OF SUPERCONDUCTIVE BASE TRANSISTOR

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Abstract

PURPOSE: To prevent an element from deteriorating in a characteristic by a method wherein a superconductive base region of an oxide superconductor is so formed as to bring only a compositional element of the oxide superconductor such as a group IIIA, a lanthanoid group, a group IIIB or a group VB elements into contact with a semiconductor interface through a growth method that the compositional element concerned is made to grow by an atomic layer at a time.

CONSTITUTION: When a superconductive base region of an oxide is formed, each compositional element of the superconductive thin film is made to grow by an atomic layer at a time to form the oxide superconductive thin film, and at the start and the end of this process, one of the elements of the thin film components such as group IIIB, a lanthanoid group, a group IIIA and a group VA elements is formed into an atomic layer which constitutes a junction face that is in contact with a semiconductor face. Therefore, the superconductive base region can be formed without oxidizing the surface of the semiconductor. Moreover, this thin film manufacturing method is the application of an atomic layer control epitaxial growth method and a very soft way to make a thin film grow as compared with a sputtering method, so that the surface of the semiconductor is protected against damage. By these processes, a junction interface between a semiconductor and an oxide superconductor excellent in quality and practicality can be realized.